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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/254,119

04/16/1999

KOHEI TATSUMI

52433/545

6495

26646

7590

01/15/2002

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 01/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/254,119

Applicant(s)

TATSUMI ET AL.

Examiner

Alonzo Chambliss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) 1 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claim 1 has been canceled.

Continued Prosecution Application

2. The request filed on 12/10/01 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/254,119 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 2-6 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasunaga et al. (U.S. 5,656,863).

With respect to Claim 16, Yasunaga teaches a semiconductor devices comprise electrodes 4, 12 formed on a chip 3. Each bump 10 has spherically formed metal ball having a given size with an adhesive 8 bonded to the electrodes 4, 12 for attachment of the bumps 10. Each electrode 4, 12 includes a layer of an electrode material 4 and at least one layer 12 laminated to the layer of the electrode material 4. The lamination between the electrode material and the layer on the surface of the electrode material

will inherently avoid deterioration of bonding such that the at least one layer 12 has peripheral dimensions substantially the same as the electrode material 4 (see Fig. 3).

With respect to Claim 2, the metal balls 10 are adhesive bonded to the electrodes with a flux (i.e. connection layer made of a solder material) (see col. 17 lines 7-11).

With respect to Claim 3, the electrodes 4 are formed from an electrode material of Al (see col. 16 lines 57 and 58).

With respect to Claim 4 and 5, the electrodes each comprise a layer of an electrode material 4 composed of Al and at least one metal layer 12 made of Ti laminated to the electrode material layer 4 that has a melting point higher than the electrode material 4 (see col. 16 lines 56-67).

With respect to Claim 6, the layer farthest from the electrode material 4 contacting the metal ball 10 is formed of Sn-Pb (see col. 17 lines 7-9).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunaga et al. (U.S. 5,656,863) as applied to claim 16 above, and further in view of Juskey, Jr. et al. (U.S. 4,940,181).


Yasunaga fails to disclose a layer laminated to an electrode material with a thickness, which is smaller than that of the electrode material. However, with respect to Claim 17, Juskey discloses a layer 22 laminated to an electrode material 18 with a thickness, which is smaller than that of the electrode material. The layer 22 has a thickness of .04 mils and the electrode layer has a thickness of .05 - .1 mils topped with an electroplated material with a thickness of 1.5 - 2 mils. The total thickness of the electrode material is between 1.55 - 2.1 mils (see col. 2 lines 52-60). Therefore, it would have been obvious to use the layer laminated to an electrode material with a smaller thickness than the electrode material with Yasunaga, since thickness would improve the strength and protection of the electrode material and to provide a superior electrical connection to the solder ball as taught by Juskey.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. It is cited primarily to show the product of the instant invention.

Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.


Alonzo Chambliss
Supervisory Patent Examiner
Technology Center 2814

AC

AC/January 8, 2002